F·A·A·M facility for airborne atmospheric measurements

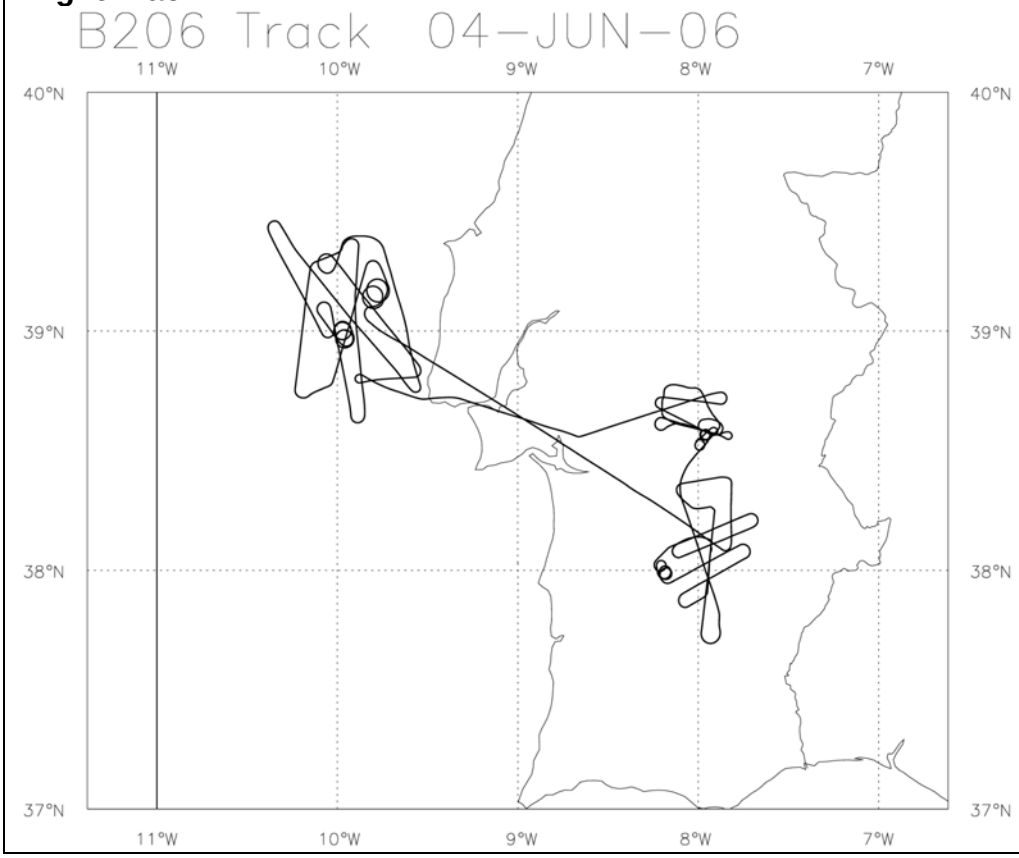
FLIGHT FOLDER

Flight No.:	B206
Date:	4th Jun 2006
Take Off	09:33:38
Landing:	14:50:58
Flight Time	5h17m20

Campaign: CLAPREC / NEON
Trials Instructions: Evora, coast nr Lisbon
Operating Area: Beja

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsay-Rae	Directflight
3	CCM	Gaynor Ottaway	Directflight
4	Mission Scientist	Dave Kindred	Met Office
5	Flight Manager	Steve Devereau	FAAM
6	ARIES	Joss Kent	Met Office
7	MARSS	James Bowles	Met Office
8	SWS	Ian Rule	Met Office
9	CVI	Jeff Brown	Met Office
10	Wet Neph	Andy Wilson	Met Office
11	Filters	Doug Anderson	FAAM
12	VPRACOP 1	Mario Reis	Instituto Technologico e Nuclear, Sacavem
13	AEROPOR 1	Frank Wagner	University of Evora
14	AEROPOR 2	Daniele Bortoli	University of Evora
15			
16			
17			
18			

Flight Track:

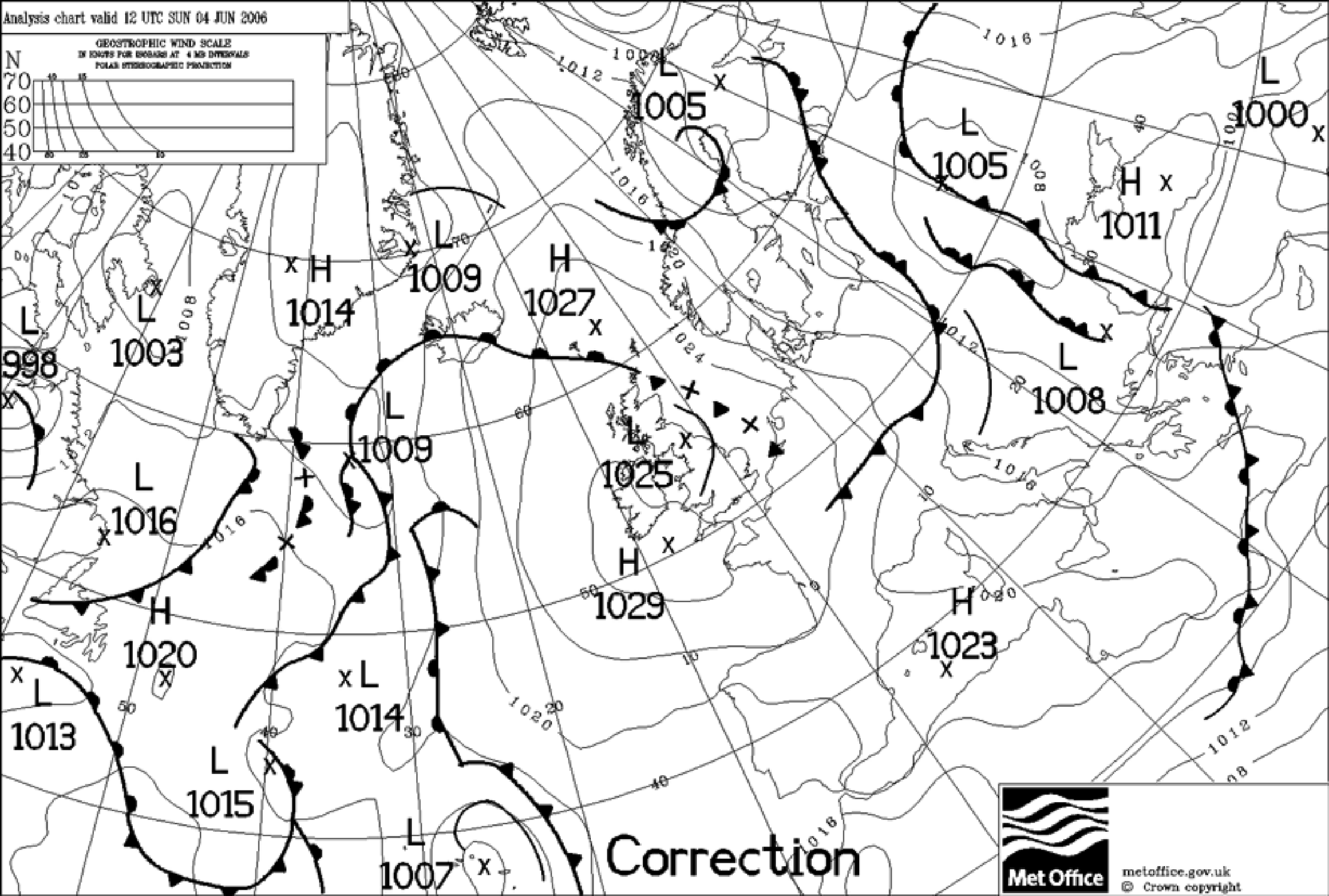


FLIGHT SUMMARY

Flight No B206
Date: 04 June 2006
Project: CAPEX AERPOR VIPRACOP
Location: Beja

Start Time	End Time	Event	Height (s)	Hdg	Comments
092435		Start-Up 4	0.44 kft	116	
092838		start taxy	0.44 kft	116	
093338		T/O	1.0 kft	184	
093729		JW zero	6.6 kft	186	
093752		Nevzorov zero	7.3 kft	186	
094240	095502	Profile 1	10.0 - 1.9 kft	344	
094746		change descent rate	4.9 kft	342	
095607		retract LBBR	1.9 kft	320	
100312	100710	Run 1.1	1.9 kft	123	
100939	101347	Run 1.2	1.9 kft	288	
101150		start H cal	1.8 kft	287	
101726	101930	Run 1.3	1.9 kft	109	
102213	102248	Orbit 1.1	1.9 kft	248	(aborted)
102331	102542	Orbit 1.2	2.0 - 1.8 kft	111	
102558	102808	Orbit 1.3	1.8 - 1.9 kft	118	
102930	103142	Orbit 1.4	1.9 - 1.8 kft	243	
103519	103917	Run 1.4	1.8 - 1.9 kft	295	
104034	104906	Profile 2	1.9 - 10.0 kft	090	
104118		LBBR extend	2.7 kft	097	
104457		interrupt profile 2	7.1 kft	097	
104621		restart profile 2	7.1 kft	260	
105546	110535	Profile 3	10.0 - 1.9 kft	293	
110122			3.9 kft	288	500ft/min
110623	110947	Profile 4	1.8 - 0.10 kft	284	
111224	112421	Profile 5	0.12 - 10.0 kft	083	
111619		int profile 5	3.9 kft	087	
111648		video	3.9 kft	023	change tapes
111739		recommence profile 5	3.9 kft	320	
113500	114439	Run 2.1	0.07 - 0.10 kft	164	
113733		retract BBR	0.08 kft	165	
114101		Heimann cal start	0.09 kft	174	
114604	115252	Profile 6	0.08 - 6.3 kft	315	start QNH 1022hPa
115259	115955	Run 3.1	6.3 kft	321	
115708		retract BBR	6.3 kft	321	
120200	120910	Run 3.2	6.3 kft	153	
121152	121533	Orbit 2.1	6.3 kft	137	
121620	122002	Orbit 2.2	6.3 kft	173	
122141	122241	Profile 7	6.3 - 7.3 kft	324	
122522	123223	Run 4.1	7.3 kft	166	
123541	124443	Run 4.2	7.3 kft	354	
124713	124828	Profile 8	7.3 - 8.3 kft	248	
124927	125627	Run 5.1	8.3 kft	188	
125536		Video	8.3 kft	188	change tapes
125946	130648	Run 5.2	8.3 kft	018	
130954	131423	Orbit 3.1	8.3 kft	191	

131537	131958	Orbit 3.2	8.3 kft	249	
132232		Video stopped	12.3 kft	125	tapes stopped
133207	140313	Profile 9	15.0 - 0.54 kft	121	
133200		interrupt Profile 9	14.1 kft	121	
133349		restart videos	14.0 kft	120	
133409		extend BBR	14.0 kft	121	
133756		restart Profile 9	14.0 kft	121	
133821		JW & nev zero	13.7 kft	124	
134538		int profile 9	7.0 kft	122	
134657		recommence profile 9	7.0 kft	004	
135045		interrupt profile 9	3.9 kft	359	
135149		recommence profile 9	3.8 kft	265	
135425		interrupt profile 9	2.9 kft	259	
135942		recommence profile 9	2.9 kft	184	QNH1018
140952	141452	Run 6.1	2.4 kft	061	
141640	142139	Run 6.2	2.4 kft	244	
142212	142735	Orbit 4.1	2.4 - 2.3 kft	299	
142848	143116	Orbit 4.2	2.4 kft	022	
143135	143230	Profile 10	2.4 - 3.4 kft	047	
143250	143756	Run 7.1	3.4 kft	066	
143757	143844	Profile 11	3.5 - 4.4 kft	069	
144027	144529	Run 8.1	4.4 kft	246	
145058		Land	0.51 kft	002	14 50 58
145617		Park posn	0.51 kft	107	38 05.13N 7 55.65W


Analysis chart valid 12 UTC SUN 04 JUN 2006
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L 998
L 1003
H 1014
L 1009
H 1027
L 1005
L 1005
H 1011
L 1000
L 1016
L 1009
L 1025
L 1008
H 1020
H 1029
H 1023
L 1013
L 1014
L 1015
L 1007
Correction
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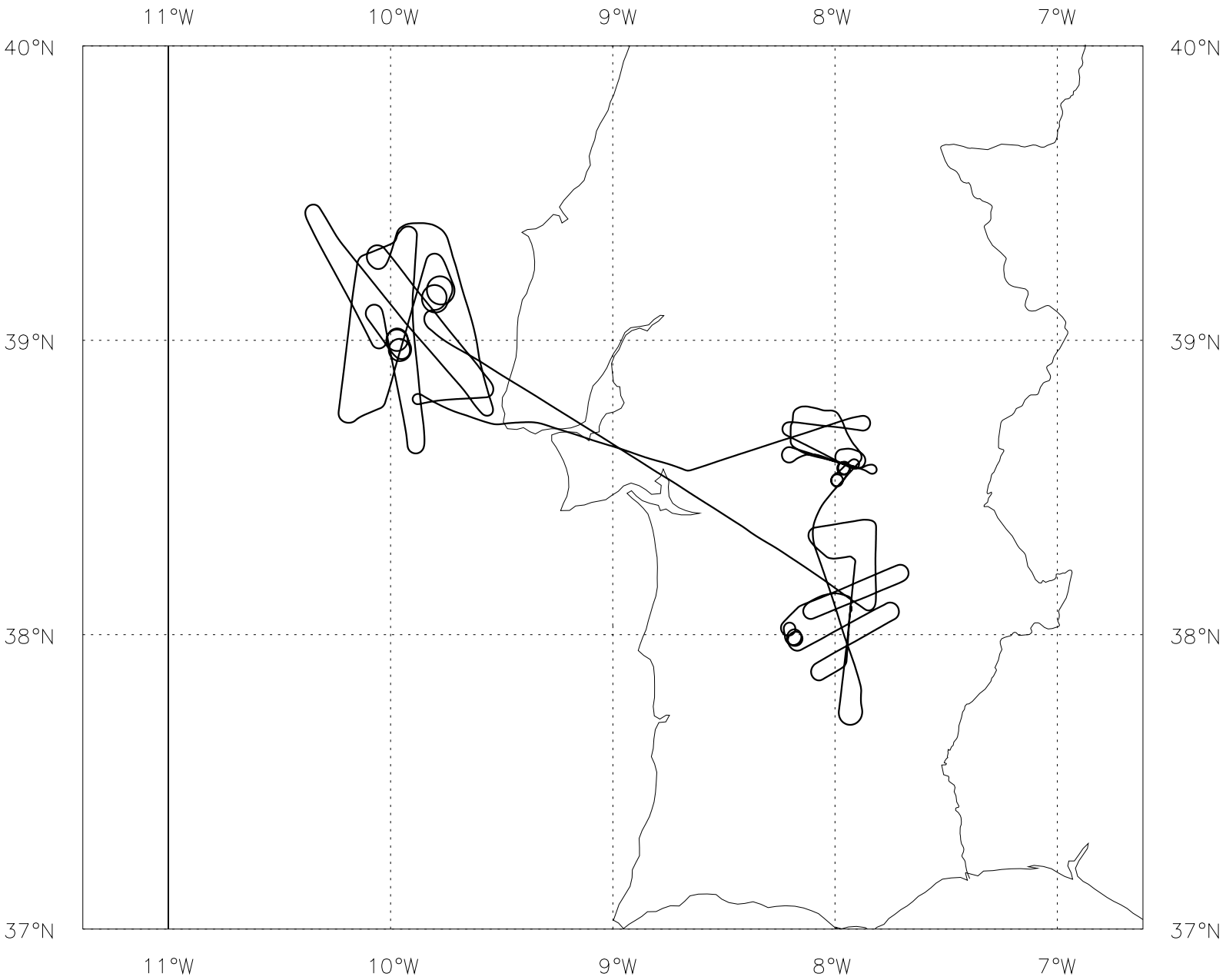
B206 Track 04-JUN-06



SORTIE BRIEF

Flight No: B206 Brief: 0830L
Date: 04/06/2006 T/O: 1030L, Land 1530L

Programme: EUFAR (European Fleet for Airborne Research)
Project: CAPEX (Clouds and Aerosol over Portugal Experiment) May/June 2006

***SORTIE 1*: Aerosols & clear skies** (Mainly AEROPOR/VPRACOP).

Conditions/Weather:

Ideally clear skies (some high cloud acceptable)

Trial Objectives:

To measure aerosol particles in differing vertical layer(s) from natural & anthropogenic sources.

Location:

Central/S. Portugal over land, or off W. Portugal coast (S of 40 deg N).

Flight Pattern:

1. Depart Beja and transit towards Evora at about FL100. (10min).

2. Profile descent from FL100 to lowest permitted height, at 1000ft/min (500 ft/min below FL 050), to finish overhead of ground-based site (including LIDAR) in central Evora, (20min).

3. Fly 2x S&L runs (each about 4 mins) at minimum permitted altitude to be overhead Evora ground station along part of run, ideally to be flown into and down sun, followed by series of 2 x orbits (about 30 deg bank) clockwise, at minimum permitted altitude. (30min).

4. Transit at medium level to another selected area - W. of Lisbon (near to Cabo da Roco), overflying Capa da Roco at minimum permitted altitude. Climb to FL100, and operate in either Capa da Roca restricted area (if possible), or in non-restricted area further to W of Lisbon (over water) for 5 & 6 below. (35 min).

5. Profile descent from FL 100 to lowest permitted altitude, at 1000 ft/min (500 ft/min below FL 050) in area of interest . (15 min).

6. For each layer of aerosol identified during the profile into the area the following runs will be flown at altitudes determined by the Mission Scientist. All altitude changes will be profiles. Runs to be oriented into or down sun.

   (a) Fly two S&L 7-minute run 1000ft below aerosol layer (or minimum altitude if aerosol is close to ground/water) into and down sun, followed by series of 2 x orbits (about 30 deg bank) clockwise. (20 min).
   (An extra run with SWS looking in the nadir may be flown to characterise the surface reflectance).

   (b) Series of 7 min straight and level runs in the aerosol layer to characterise microphysics of plume. Number will depend on thickness of layer. (15 min).

   (c) Fly two S&L reciprocal runs, 1000ft above the aerosol layer, each 7 minutes, into and down sun angle, followed by series of 2 x orbits (about 30 deg bank) clockwise. (An additional run with SWS looking in nadir may be flown). (20 min).

7. Transit at medium/high level to another selected area around Beja, and repeat 5 (but from FL150) and 6 above, as time allows. (115 mins).

8. Recover to Beja. (20 mins).

(Total time: 5h 00 m).

DRK
03/06/2006

Notes:

1. EVORA LIDAR: In centre of town; approx 4 km N. of Evora airfield. La: 38 deg 34 ´ 04" N, Lo: 07 deg 54´43" W. Elevation: 293 m.

2. CAPA DA ROCA: CIMEL Sun photometer ground site. La: 38 deg 46´58" N, Lo 09 deg 30´00" W.
   Altitude: 140 m.

AIRCRAFT SCIENTIST DEBRIEFING SHEET

Date: 04/06/06. Flight number: B206

CAPEX Detachment, Beja. AEROPOR (Type 1) sortie. (To measure aerosol particles in differing vertical layers from natural & anthropogenic sources).

Overall, a very successful flight.
Firstly, horizontal runs and orbits were made close to Evora ground lidar site (in centre of town, operated by Evora University). After overflying Cabo da Roca (coastal CIMEL sun photometer site) at minimum permitted altitude, vertical stack patterns were then made (a) in Restricted areas R42A,B just West of Lisbon (overwater), then finally over and around the local Beja area.
Cloud Physics PCASP was unavailable for this flight (undergoing change of laser), but the CVI PCASP worked well. ARIES suffered a software problem for about the first hour of flight, but thereafter OK; no other instrument problems were reported. A good dataset therefore, with SWS/SHIMS, MARSS (including channel 16), CVI, and Wet Neph working particularly well. Filter samples for the VPRACOP group were taken through the sortie. A co-ordinated approach for viewing angles for SWS and ARIES (also for HEIMAN - see instrument logs) was operated throughout.
Weather conditions were almost ideal. No cloud initially was present, but about 2-3/8 thin Cirrus slowly invaded the maritime operating area from the west during the flight. Otherwise no medium or low cloud was present. Winds were light at all levels, mainly SE'ly. Visibility was good throughout. The main aerosol/pollution layers were in general much more pronounced visually (verified from instruments, mainly CVI), over land compared to over the water.

After T/O from Beja at 0934Z on Runway 19, we were quickly into our first profile descent from FL100, at 1000 ft/min, reducing to 500 ft/min below 5000 ft, to finish overhead Evora Lidar. Two S&L 4-minute runs, and one 2-minute run were made into sun and downsun, at 2000 ft, WNW – ESE, with Evora Lidar at the E end of these. This was followed by 3 clockwise orbits (at 2000 ft, following the current solar zenith angle in terms of bank angle) centred to NW of Evora, finishing with a 4-minute S&L run, starting o/h Evora and running WNW, away from sun.
Next, we profiled (P2) from 2000 ft to FL100, initially towards Evora, then heading W towards Lisbon. Tops of the pollution layer here was about 8500 ft. We then made a profile descent (P3), from FL100 to finish o/h Cabo da Roca at lowest permitted altitude at 2000 ft at 1000 ft/min, but changing to 5000 ft/min below 5000 ft. Profiles P4 and P5 combined meant we climbed from 50 ft to 250 ft (P3), then from 250 ft to FL100 (P4) in the area near Cabo da Roca to investigate the temp/moisture/aerosol/pollution structure. From the resultant tephigram, the main (marine) inversion/hydrolapse was at 7250 ft, so chosen levels to work here were 6250 ft (below), 7250 ft (in) and 8250 ft (above) the main aerosol layer.
A S&L run to characterise the sea surface was made at 250 ft (about 10 mins), followed by a profile ascent to 6250 ft. A series of runs (R3.1, R3.2) into & down sun, and orbits (O2.1, O2.2) were made at 6250 ft, then climbing to 7250 ft (P7). Runs into and down sun at 7250 ft (R4.1, R4.2) were made in this pollution layer. After climbing to 8250 ft (P8), Runs 5.1 & 5.2 were made into & down sun, followed by Orbits 3.1 & 3.2 at about 17 deg solar zenith angle.
After this, we climbed to FL150 and transited back via o/h Lisbon to Beja, and profiled down into the base area (P9) from initially FL150, then from FL 140, at 1000 ft/min, changing rate to 500 ft/min at 5000 ft, all the way down to 50 ft as a missed approach. From the information gathered during P9, we decided on a main pollution layer, centred at 3500 ft. S&L runs were therefore made at 1000 ft below (R6.1 & 6.2), into and down sun, at 2500 ft, with Orbits O4.1 & O4.2 to follow, a profile ascent to 3500 ft (P10), with a single S&L down sun run made at

this height, (Run 7.1), a profile ascent to 4500 ft as P11 at 1000 ft/min, followed by a final single S&L run at 4500 ft as R8.1.
After quickly getting all gear suitably stowed for landing, we landed at Beja at 1551z, after a busy, but successful, sortie lasting 5h 17m.

DRK
06/06/06

CORE CHEMISTRY FLIGHT LOG FOR FLIGHT FOLDER

Flight Number : B206
Date : 04/06/06
Operator and contact info : Kate Turnbull katet@faam.ac.uk

Problems with Instruments

CO	**None**
O_3	**None**
NO_x	**Ozonator flow low (< 0.02 lpm) at FL100 and above.**
SO_2	**N/A**
TDLAS	**N/A**
WAS	**N/A**

N.B. The PI requested that Core Chemistry run automatically. Therefore, what actually happened during the flights is not known but it is assumed that the problem with the NOx analyser noted on B204 was also a potential problem during B205.

Mission Scientist's Log

AEROPOR (CAPEX - TYPE ①)

Flight No **B206** Date **04/06/2006** Page 1 of 7

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
0923		→			QNH = 1019 mb (BEJA).
0924		→			Engine start up.
0929		→			Start TAXI; T/O R/W 19 (TOS)
					Nil CLOUD (SKC). Good surface VIS (>15Km)
093358					T/O BEJA. Climb to FL100 (heading S).
09353>	Climb out.	Passing 4000' (1019)	190°		
0941					Haze/Aerosol tops ~ 8500/9000'
					(coincident with inversion)
054240	START P1	10.0kft	343°	37.5°N 7°54'W	Start P1 Wind 075°/3m/sec
094745	P1	5.0kft	342°	38°06'N 8°0'W.	Haze/Aerosol top 8500/9000'. Change descent rate to 500/min
095300	P1	3.0kft	346°	38°24'N 07°54'W	SKC Wind 140°/4m/sec
095410			→		Passing Evora Airfield (to Stbd) abeam.
095502	P1 end	1.8kft	044°	38°30'N 07°48'W	End P1 (Lidar O/H – EVORA)
					Manoeuvring to start down sun run
100312	START R1.1	1.8kft	107°	3°	Start R1.1 (at 2000' 1015 mb) (4mm)
					Into sun, finishing o/h EVORA LIDAR
100710	END R1.	1.9kft	104°	38°30'N 7°48'W	End R1.1 170°/05 m/sec
				(Turning L)	Manoeuvre to start down-sun run next
100935	START 1.2.	1.8kft	289°	38°30'N 07°46.	Start R1.2 o/h Evora (2000' 1019mb)
101120				(SKY CLEAR)	Wind 103°/3m/sec. Temp +20.6°C Dpt +9.6°C
101347	END R1.2	1.8kft	286°	38°36'N 8°12'W	End R1.2. Turning for 2 min run back towards
101724	START 2.3	1.8kft	112°	38°30'N 8°W.	Start 1.3 into sun, towards Evora.
10,930	END R1.3	1.8kft	192°	38°30'N 7°48'W	End R1.3 } Manoeuvre, before
					starting 2x orbits
102213	START ORBIT 1	1.8kft	241°	—	Start } going A/CLOCKWISE IN ERROR
102440	END 1.1	—	—	—	End orbit } WILL RE-DO THIS ORBIT!

ARRIVES SW PORTUGAL

Mission Scientist's Log

R 42A
R 42B

Flight No B..206..... Date ..4/6/06..... Page 2 of 7

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
102331	ORBIT 1.2.	1.7kft	145°	38°30N 7°54W	Start orbit 1.2 CLOCKWISE THIS TIME (Sol. Zen angle 32°)
102543	ORBIT 1.2	1.8kft			End Orbit 1.2.
102559	ORBIT 1.3	1.8kft			Start orbit 1.3
102808	END 1.3	1.8kft		38°30'N 7°54W	End orbit 1.3 } will do another orbit for SWS.
					} Manoeuvre for N/min.
102930	START ORBIT 1.4	1.8kft	250°		Start orbit 1.4 (offset to SW from [illegible] 1.2/1.3).
103142	END OF 1.4	1.8 kft		38°30'N 8°0W	End orbit 1.4. low level
					Will finish by doing final run to NW (4 min)
~~103450~~		→			~~O/H ENDORA TWR~~ to exit Evora area.
103519	START 1.4	1.8kft	295°	38°30'N 7°54	Start Run 1.4. (AWAY FROM SUN)
103748		→			} Passing Lake / Reservoir to SW end.
					} Wind 110° / 4m/sec [S'ly 5 kts] NOT CREW.
103917	END 1.4.	1.8kft		38°36'N 8°12'W.	} End Run 1.4
					} .
104034	START P2.	2.0kft	095°		Start Profile P2, 2000' ↗ 10000'.
					towards Evora, then leave area.
1041	Passing	3200', aircrew change to 1013 Alt. Setting.			
104457	Inter.	7.1kft			Interrupt P2 & turning ↶ before complete P2 to FL100.
104621	Restart P2	7.2kft	258°.		Resume P2.
104740		8500'			Top of haze/poll^n layer here (CVI & visually). (from T/Op.)
					} SKC, apart from Trace Ci to West.
104906	END P2	10.0kft	252°	38°36'N 8°60'W	End P2 Transit → Lisbon →
					CABO DA ROCA
105546	START P3	10.0kft	285°	38°30'N 8°42'W.	Start P3 ↘ 1000'/min
105710		8.8kft	→		Set 1019 QNH now
110124			→		Change to 500'/min Passing Lisbon
110200			→		o/h mouth of estuary now.

Mission Scientist's Log

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
110530			←		o/h Cape da Roca nav (as as close as we can pass)
110535	End P3	1.8kft			End P3
110623	START P4	1.8kft	287°	38°42'N 9°36'W	Start P4 to 50' over water (to WNW of Cape da Roca)
110947	End P4	250'	294°	38°49'N 9°48'W	End P4 at 250'
					Turning ↑ before climbing to FL100.
					to investigate Marine BL.
111124	START P5	250'	083°	38°42'N 9°48'W	Start P5, towards Capa, will turn ← at 4000' & then resume climb to FL100 heading NW.
11 15		3100'		Cpod	Inversion / Isothermal layer top here.
111625	Interrupt P5	3.8kft			Interrupt P5 just shy of coast:
					SKC except for 1/8 Ci to NW
111739	Restart P5	3.8kft			Restart P5 ↗ 1000'/min
					CVI counts here ~1/3 of over land (some ship exhaust seen low level)
		4400'			Inversion / hydrolapse here, visual haze top here
					(also fewer counts above on CVI).
112423	END P5	10.0kft	322°	39°02'N 9°54'W	End P5.
					Will descend to 250' & perform 7min run to characterise S. surface (not profile)
113400	START 2.1	250'	164°	39°12'N 9°43'W	Start R2.1 at 250'. (characterise sea surface).
1136			→		Wind 190°/5knots 210/15kt (cockpit)
					Hazy here, below inversion.
114140		330			Climb a little (insect/bird avoidance)
114240				& again here	Staying off coast (S of Cabo da Roca)
114439	END 2.1	300'	172°	38°42'N 9°30'W	Turn Final R2.1 then Profile ↗ 1000'/min to 6250' (1022 mb)
114604	START P6	300'	318°		Profile P6 ↗

Mission Scientist's Log

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
115252	End P6 / Start 3.1	6.3 kft	321°	39°0'N 9°54'W	End P6 / Start R3.1 at 6250'. (7 min run)
					Wind 125°/2 m/sec.
SOLAR AZIMUTH → 144°.					
115955	End R3.1	6.3kft		39°24'N 10°18'W	End 3.1. Turning R onto reciprocal. for next 7 min run
A2. 181°					[Haze pollution layer less pronounced above as we go further from coast]
120200	START R3.2	6.3kft	153°	39°18'N 10°18'W	Start s/b sun run (UNDER ACLOUD LAYER 1000' below)
A2 153°					2/8 thin Ci (to SW) otherwise SKC
1208.			←		Wind 309°/3 m/sec.
120910	End R3.2	6.2kft	0	38°54'N 10°00W	End R3.2 at 6250'.
1210	ABORT				Start Orbit 2.1, abort (sws not ready), start again shortly.
121152	ORBIT 2.1	6.3kft	171°	39°0'N 9°54'W	Start Orbit 2.1
					About 28 miles from Photometer site for this orbit
121523	End 2.1	6.3kft	156°		End Orbit 2.1
121620	START 02.2.	6.3kft		38°54'N 9°54'W	Start Orbit 2.2.
					Thicker Haze/Pollution over land.
122002	End 0.2.2	6.3kft		38°54'N 9°54'W	End Orbit 2.2. Manoeuvre then climb to 7250'.
122141					Start P7
122231.	End P7	7.2kft	325°		End P7 at 7250'.
A2=167°	122522 START 4.1	7.3kft	169°	39°00'N 10°00'W	Start R4.1 at 7250' in aerosol layer.
					Little visual evidence of pollution here. but starts over coast & inland significantly
A2 → 179°					3/8 Ci (to S mainly)
	123233 End R4.1	7.2kft		38°30'N 9°48'W	End R4.1 Manoeuvre for sws to prepare for next run.
A2=175°	123541 START R4.2	7.2kft			Start R4.2.
	124443 End R4.2	7.2kft	340°	39°18'N 9°48'W	End R4.2. Wind 125°/1 m/sec
					Climb to above aerosol layer 8250'.
124713	START P8	7.2	248°		Start P8 Climb to 8250'

Mission Scientist's Log

Flight No **B**206 Date 4/6/06 Page 5 of 7

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
124828	END P8.	8250'			End P8
124937	START RS.1	8250'	187°	39°6'N 10°6'W	Start RS.1 into Sun.
Az=187° 125635	END RS.1	8250'			End RS.1 Turn onto reciprocal downsun
					SWS cashed out, need ~2mi to recover.
Az=196° 125946	START S.2	8250'	017°	38°48'N 10°10'W	Start RS.2 downsun.
					WIND 145°/16 m/sec.
					Ci to W, clear over land
				Thicker	Haze/Pollution "hugging land"/locked onto land surface.
130648	END RS.2	8250'		39°12'N 9°48'W	End S.2
130954	START O3.1	8:314ft	2	39°6'N 9°43'W	Start Orbit 3.1. (17° SOLAR AZ.)
					Some Ci now between Sun & A/C on these orbits.
131423	END O3.1	8.3kft			End O3.1
131537	START O3.2	8.3kft	257°	39.0°N 9°48'W.	Start Orbit 3.2.
131959	END O3.2	8.3kft		39.0°N 9°48'W	End Orbit 3.2. Climb towards FL150 ~~transit to Beja~~ for last stack pattern.
1324		→			Up to FL150 now
132535		→			O/h coast now (6 miles N. of Cabo da Roca).
N1330 P9	Descend FL150	~FL140			PASSING O/H LISBON AT FL150.
133620	TRANSIT TO BEJA	14.0kft	121°	38°24'N 8°30'W	Re-Start descent FL140 ↘ towards BEJA
133756	DESCENT P9.	14.0kft	118°.		Reconnoitre P9, 27 miles from BEJA.
					Good Haze/Pollution layer ahead.
					Beja QNH = 1019 mb.
					Small inversion/iso at 6500'. Haze/Pollution Top visibility 9000'.
134538	P9 Interrupt				Interrupt P9 turn ↰
					Will finish P9 o/h Beja at 50' (missed approach)

Mission Scientist's Log

CLEAR ABOVE [redacted] 10000'

[redacted] 5000' MAX.

2+0°

Flight No **B** 206 Date 4/6/06 Page 6 of 7

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
134657	PG	7.0kft	003°	38°6'N 7°48'W	Recommence PG
1348					Dew Pt. varying rapidly 5000' to 6500'.
134943		5.0kft			Change descent rate to 500'/min
135045	Interc PG.	~~3~~ 8kft			Interrupt PG, turn ↰
135149					Recomm PG
135425	Interc PG.	2.8kft (3000 ft NH)			Interrupt PG (1019), cb
135642					Changing to 1018 Local QNH now
135942	Recomm PG	2.8kft (3000ft)			Recomm PG Approaching Beja from N.
140312	End PG	→	183°	38°0'N 7°54'W	O/h threshold Beja 50' End PG
					Climb to 2500' [redacted] 4500'
					Will work [redacted] 3500' (MAIN LAYER) 2500'
140952	START RG.1	2.3kft	063°	37°48'00	Start RG.1, downsun.
141255					Beja to Port.
141452 (X2. 242°)	End 6.1				End RG.1
141640	START 6.2	2.4kft	243°	38.00'N 7°48'W	Start 6.2 into Sun
141630			→		Passing abeam Beja. to stbd.
142139	End 6.2	2.4kft			End RG.2. Thin Cu slowly increasing from W (in distance)
142212	Orbit 4.1		↷		Start Orbit 4.1
142			↙		Re-start Orbit 4.1 Extend orbit to ~1½ times for SMS.
142735	End 04.1	2.3kft		37°54'N 8°12W	End orbit to 1
142850	START 04.2	2.3kft	↙		Start orbit 4.2
143136					End orbit 4.2
143135	START P10				Start P10 2500'/3500'.
143230 (247°)	End PP				End P10.
143250					Start Downsun Run 7.1 at 3500'.

Mission Scientist's Log

Flight No **B** 206 Date 4/6/06 Page 7 of 7

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
143757	End R7.1	3.3kft	069°		End R7.1 at 3600', Restart P11 at 1000'/min to 4500'.
143845	End P11	4.5kft			End P11 /
144027	START R8.1	4.5kft			Start R8.1 into sun.
144529	End R8.1	4.5kft	~250°		End R8.1 & prepare to Land at Beja
		=		END SCIENCE.	= Very soon afterwards
1551		←			LAND BEJA.
0934					
5:17hrs					

>49°

P.S.A.P. Log

Flight No. **B**.206..... Date .04/06/06..... Page ..1 of .1.....

GMT	Filter Trans.	Flow Rate	B_a x 10^{-6}	Ph_det levels		Run	Remarks
Set to DRS time	New filter Tr = 1.000	Set to 3.0 lpm				(30s) ? Ave = s	←Preflight
081000	1.00	3.0	23.6	20	47	30	ok
093900	0.98	3		18	47	30	start data
101155	0.958	3	5.6	17	47	30	
145740	0.797	3		17	47	30	data stop on ground

Filter Sampling Log

Flight No: B206 **Date:** 4 Jun 2006 **Operator:** Mario / Doug

Type of filters mounted in	Top inlet	90mm diameter types AC, PC & P	Bottom inlet	90mm diameter types AC, PC & P

Run No	Disk #1 TOP	Disk #2 MIDDLE	Disk #3 BOTTOM	Inlet Top/ Bottom	Time On	Time Off	Flight Run	Accum Vol [l]	Comments
Filters run 1	AC37	-	-	Top	10:03:28	10:19:34	R1.1/2/3	940	1900' R1.1 10:03:28-10:07:10 (into sun) R1.2 10:19:39, R1.3 10:17:26-10:19:30
Filters run 1	AC38	-	-	Bottom	10:03:28	10:19:34	R1.1/2/3	1290	
Filters run 2	PC15	-	-	Top	11:35:00	11:44:40	R2.1	732	250' above sea level towards Cabo da Roco R2.1 1 11:35:00- 11:44:39
Filters run 2	PC16	-	-	Bottom	11:35:00	11:44:40	R2.1	1007	
Filters run 3	PC17	-	-	Top	11:52:57	12:10:55	R3.1/2	1687	6300' (over sea, below aerosol layer)
Filters run 3	PC18	-	-	Bottom	11:52:57	12:10:55	R3.1/2	2307	
Filters run 4	PC19	-	-	Top	12:23:21	12:44:43	R4.1/2	2334	7300' (over sea, in aerosol layer)
Filters run 4	PC20	-	-	Bottom	12:23:21	12:44:43	R4.1/2	2169	
Filters run 5	P11	-	-	Top	12:48:38	13:06:48	R5.1/2	2534	8300' (over sea, above aerosol layer) Both filters loose at end of run
Filters run 5	P12	-	-	Bottom	12:48:38	13:06:48	R5.1/2	3158	
Filters run 6	AC39	-	-	Top	13:23:	13:32:45	transit	637	FL150 (Transit to Beja area) Top filter broke
Filters run 6	AC40	-	-	Bottom	13:23:	13:32:45	transit	898	
Filters run 7	P13	-	-	Top	14:10:04	14:21:42	R6.1/2	1067	2500' (under haze layer)
Filters run 7	P14	-	-	Bottom	14:10:04	14:21:42	R6.1/2	1134	2500' (under haze layer)
Filters run 8	PC21	-	-	Top	14:32:47	14:37:51	R7.1	664	3500' (in haze layer)
Filters run 8	PC22	-	-	Bottom	14:32:47	14:37:51	R7.1	819	3500' (in haze layer)
Filters run 9	PC23	-	-	Top	14:39:19	14:45:29	R8.1	577	4500' (above haze layer)
Filters run 9	PC24	-	-	Bottom	14:39:19	14:45:29	R8.1	759	4500' (above haze layer)

ARIES flight log

Flight: B206 | Location: BEJA, Portugal | page 1 of

Date: 4/06/06 | Operator(s): Joss Kerr | Resolution: 1 (on ground) | Gain A: 2 B: 2

Notes:

DRS time	Flight ptrn	Filename	Shtr	HBB	CBB	Mir.	Det.	Win	Macro(s)	Comments
093338	T/O — 120 scans now OK → until 0955 @ low level - ARIES coming up with "Flight ID requires Scanners" when trying to run a Macro. Reloaded all software, but still a problem. In the end changing disk from C: to H: did the job. Don't know why! All working OK now though.									
105305	Transit	B206E	Clsd			—	HBB @		52.6°C — will rise to 70°C.	
113121	Replein.	B206F	Clsd	70.9	31.4	22.9	-190.6	34.0	CH1 x2	@ before scan starts
113500	R1.1	B206G	Clsd	70.8	30.7	23.3	-190.6		N1 x2	
113622	R2.1	B206H	Clsd					33.4	N1 x 3	
113809	R2.1	B206I	open	70.6	31.1	24.6	-190.6	32.6	Z1 x2	Quick zenith view.
113925	R2.1	B206J	Clsd	↑	↑	↑	↑	↑	CH1 x2	
114041	R2.1	B206K	Clsd	71.0	31.6	24.9	-190.6	32.6	N1 x 3	
114302	R2.1	B206L	Clsd						N1 x 2	
114414	R2.1	B206M	Clsd	71.0	31.3	25.1	-190.6	32.6	CH1 x2.	
115137	Replab	B206N	Clsd	70.6	31.2	25.9	-189.9	33.8	CH1 x2	
115252	R3.1	B206O	Open						Z1 x5.	
115537	R3.1	B206P	Clsd						CH1 x2	
115656	R3.1	B206Q	Clsd	70.9	31.8	23.9	-190.6	31.9	~~N1 x2~~ CH1x2	
115869	R3.1	B206R	Open						Z1 x2	
115941	R3.1	B206S	Clsd	70.9	31.8	22.6	-189.9	31.1	CH1 x2	

ARIES flight log

Flight: B206 **Location:** Portugal, off Lisbon **page** 2 **of**

Date: 4/6/06 **Operator(s):** Joss **Resolution:** 2 **Gain A:** 2 **B:** 2

Notes:

DRS time	Flight ptrn	Filename	Shtr	HBB	CBB	Mir.	Det.	Win	Macro(s)	Comments
120262	R3.2	B206T	~~open~~ clsd	70.0	31.8	22.7	-190.6	31.9	Z1 x 5	
120440	R3.2	B206U	clsd	71.52	31.9	21.7	-190.9	30.5	CH1 x 2	
120555	R3.2	B206V	open	70.7	32.0	21.9	-189.9	30.9	Z1 x4	
120820	R3.2	B206W	clsd						N1 x 2	
120944	R3.2 end	B206X	clsd	71.0	31.8	21.1	-189.9	30.4	CH1	Overran run slightly
122249	P7 end	B206Y	clsd	71.0	31.0	21.4	-190.6	32.7	CH1	cw e run start.
122529	R4.1	B206Z	open	70.7	31.1	20.4	-190.6	32.0	Z1 x 5	
122805	R4.1	B2060	clsd	71.1	31.5	19.9	-190.6	29.7	CH1 x2	
122924	R4.1	B2061	open						Z1 x4	
123132	R4.1	B2062	clsd						N1 x2	
123246	R4.1 end	B2063	clsd	71.0	30.8	20.0	-190.6	29.8	CH1 x 2	
123519	R4.2 start	B2064	clsd	71.0	31.1	20.2	-190.6	30.2	CH1 x 2	Rebooted software for navings run prob
123634	" "	B2065	open	70.5					Z1 x4	
123947	" "	B2066	clsd						CH1 x2	
124001	" "	B2067	clsd	70.9	31.7	20.1	-190.6	30.2	N1 x 4	
~~124346~~	" "	B2068	clsd ~~open~~	70.8	30.6	20.2	-190.6	30.2	CH1 x 2	
124346	" "	B2069	open	70.5	31.7	20.2	-190.6	29.4	Z1 x 2	
124500	" "	C206A	clsd	71.2	31.0	19.6	-190.6	29.4	CH1 x 2	
124818	.	C206B	clsd	70.9	31.0	20.0	-190.6	30.8	CH1 x2	

ARIES flight log

Flight: B206 | Location: Portugal, off Lisbon | page 3 of

Date: 4/6/06 | Operator(s): JoSS. | Resolution: 2 | Gain A: 2 B: 2

Notes:

DRS time	Flight ptrn	Filename	Shtr	HBB	CBB	Mir.	Det.	Win	Macro(s)	Comments
124936	RS-1	C206C	~~Shd~~	70-9	31-0	20-1	-190-6	30-8	N1 x5	
125210	RS-1	C206D	Clsd	71-0	31-4	19-7	-190-6	30-2	CH1	
125344	RS-1	C206E	open	70-6					Z1 x5	
125930	RS-1end	C206F	clsd	71-0	31-0	19-2	-190-6	29-2	~~CH1 x1~~ CH1 x2	
130047	RS-2	C206G	clsd						N1 x5	
130321	RS-2	C206H	clsd	70-9	31-4	18-9	-190-6	29-3	CH1 x2	
130434	RS-2	C206I	open						Z1 x4	Crows end of run
130651	RS-2	C206J	clsd	70-4	31-5	18-8	-190-6	27-9	CH1 x2	
140535		C206K	clsd	70-8	30-9	22-8	-189-9	30-6	CH1 x2	
140819		C206L	clsd	71-1	30-9	23-7	-189-9	30-8	CH1 x2	
141002	RG-1	C206M	Open						Z1 x5	
141245	RG-1	C206N	clsd	70-5	32-4	27-9	-190-6	30-9	Glow3 x4	
141355	RG-1	C206O	Open						Z1 x2	
141513	RG-1	C206P	clsd	71-1	34-8	28-7	-190-6	30-1	CH1 x2	
141702	RG-2	C206Q	clsd						Glow3x4	
141815	RG-2	C206R	clsd						Glow 3x4	
141936	RG-2	C206S	Open						Z1 x4	Shutter closed 2 scans
142026	RG-2	C206T	Open						~~Glow~~ Z1 x4	

ARIES flight log

Flight: B206 | Location: | page 4 of 4

Date: 4/6/66 | Operator(s): | Resolution: | Gain A: | B:

Notes:

DRS time	Flight ptrn	Filename	Shtr	HBB	CBB	Mir.	Det.	Win	Macro(s)	Comments
142234	R6.2	C206U	clsd	70.5	36.7	29.6	-190.6	31.9	CH1 x2	
143130	.	C206V	clsd	70.5	40.9	30.2	-190.6	33.5	CH1 x2	
143234	R7.1	C206W	open						Z1 x5	
143539	R7.1	C206X	clsd						Glow3 x4	
143702	R7.1	C206Y	clsd	71.0	40.9	29.6	-190.6	33.2	CH1 x2	
143845	.	C206Z	clsd	71.0	40.5	29.7	-190.6	33.5	CH1 x2	
144024	R8.1	C206A	clsd	71.0	40.0	29.3			Glow3 x4	
144134	R8.1	C2061	clsd						Glow3 x4	
144235	R8.1	C2062	clsd						Glow3 x4	
144346	R8.1	C2063	open						Z1 x4	
144553	R8.1	C2064	clsd	70.2	39.4	27.0	-190.6	32.3	CH1 x2	

Microwave Radiometers FLIGHT LOG	Date	04/06/06	Flight	B206	log pages	
Operator(s)	JB		Campaign	CAPEX		
Departure	Beja		Arrival	Beja		

System start

MARSS

Visual pod inspection						•
Close 3 SSP circuit breakers						•
Close all MARSS circuit breakers						•
FERA on				at time	07:08:35	
Temperature controller initial temps	Ch16	20°C	Ch 17	20°C	Ch18	19.6°C
Temperature controller set points		54°C		58°C	-20	40°C
MARSS CPU on				at time	07:12:50	
Initial target temperatures	Hot	290.3		Cold	291.1	
Target heating						•
*** CHECK SCAN HEAD CLEAR ***						•
Scanning on (LMD box)				at time	07:14:26	
Scan indication		Monitor	•		Visual	•

Deimos

Close all Deimos circuit breakers	Not Fitted					
Turn on Deimos CPU						
*** CHECK SCAN HEAD CLEAR ***						
Start Deimos Software				at time		
Initial target temperatures	Hot			Cold		
Target heating						
Scan indication		Monitor			Visual	
Weather	Cloud	none		Precip	None	
	Surface	dry		Pressure	1019	
	Other					

System functionality check

(after initial system warmup, approx 1 hour)

PC to DRS Time error		$t_{PC}=t_{DRS}$ +	0	at time	07:15:00	
Brightness temps 'sensible'						•
Target temps	MARSS:	Hot		Cold		
	Deimos:	Hot		Cold		

Channel gains 'sensible'	Ch1 A (-)	Ch3 A (-)	Ch1 B (-)	Ch3 B (-)	
	Ch16 (40-44)	Ch17 (45-49)	Ch18 (40-44)	Ch19 (40-44)	Ch20 (44-48)
	43.5	34.1	38.49	40.66	41.8

Power changeover

Headset on before start			•
Listen to engine start sequence	4, 3, 2, 1.		•
LMD off (3 switches, bottom to top)			•
Exit Deimos Software (x)			
POWER CHANGEOVER			
LMD on (3 switches, top to bottom)	then pushbutton		•
Restart Deimos Software			
System running again		at time	

Flight #	B	Date		Operator(s)		log page	2	of	2

Time	Run id	Alt/FL	*Remarks*	Sys
08:07	**Pre**		Sun on scan head, no spikes yet..	
09:12	**Pre**		Spikes started, same timeas B205 pre. Similar temp and turn on time	
09:24	**Pre**		Ch16 70k spikes Ch17 60K spikes Ch18 60k C19 50K Ch20 70k	
09:42	**Trans**		Loads a spikes & clear skies	
09:48:30	**P1**		Spikes gone after ascent to 10000ft, still gone on descent	
09:51	**P1**		Ch.17 generally noisy	
09:54	**P1**		Some spikes apearing on descent	
10:41	**P2**		All work at 2000ft, spike free	
10:52	**Trans2**		Clear of spikes at 10000ft	
11:00:30	**P2**		Land to sea transition, skirtingcoast	
11:42	**2.1**		Spike at end of 250ft run, warming back up.	
12:50	**R5.1**		4 ci above	
13:26:04	**Trans3**		Sea to land transition	
14:59:10			Marss pc time 14:58:25 laptop 14:59:04	

Wet Nephelometer Log

Flight No **B** 206 Date 04/06/2006 Operator's name: WILSON Page 1 of 5

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
093908		—	11.0	3.1	34	—	22	Data start
094240	P1	FL100↘	12.2	3.1	34	—	22	
094300			12.2	3.1	34	~~→~~↗	22	set water to 41°C
094645	P1	060	12.3	17.4	65	↗	40	
095430	P1	2000ft	14	35	72	↗	40	set to 43°C
095502	P1	2000ft	13.5	40	77	→	43	end P1 @ 2000ft
095954	Positioning	2000ft	13.6	39	81	↘	43	set to +11°C
100312	R1.1	2000ft	13.8	44	66	↘	29	start R1.1 into Sun & over Evora LIDAR site
100710	R1.1	2000ft	13.5	42	52	↘	19	end R1.1.
100910	Positioning	-"-	13.7	43	48	→	14	set to +4°C
100939	R1.2	2000ft	13.7	42.5	51	↗	31	Start R1.2
101347	R1.2	2000ft	13.4	43	85	—	44	end R1.2 - Scattering increases by 40% with a doubling of the humidity.
101726	R1.3	2000ft	13.5	44	88	—	44	start R1.3
101930	R1.3	2000ft	13.5	43	88	—	44	end R1.3
102059				44	~~88~~	↘	44	set to +6C
~~102213~~								
102331	orbit 1.2	2000	13.7	46	69	↘	28	start orbit 1.2 (orbit 1.1 abandoned - wrong direction)
102542	1.2	2000ft	13.7	41	61	↘	23	
102559	1.3	-"-	13.6	41	58	↘	21	start orbit 1.3 (30° AoB)
102809	1.3	-"-	13.6	42	54	↘	19	end orbit 1.3

Wet Nephelometer Log

Flight No B206 Date 04/06/06 Operator's name: Wilson Page 2 of 5

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
102930	orbit 1.4	2000ft	13.5	42	51	↗	16	set temp to +4c. Start orbit 1.4
103142	1.4	-"-	13.8	43	69	↗	42	end orbit 1.4
1034				42	84	—	44	Aerosol shows marked growth at 70% RH (30% growth)
103519	R1.4	2000ft	13.6	40	85	-	44	Start R1.4
103917	R1.4	-"-	13.5	42.5	87	-	44	end R1.4
104044	P2	2000ft↗	13.5	41	87	—	44	Start P2 → FL100
104906	P2	FL100	12.1	1.1	81	—	44	end P2 @ FL100
105311	Transit	FL100	11.9	1.8	77	↘	44	set temp to +11C
105546	P3	100 ↘	13.1	0	44	↘	23	Start P3 → 250ft.
110100	.	4000ft	13.8	21	38	↘	16	
110225		3000ft	14.2	18	35	↗	15	set water temp to +43C
110535	P3	2000ft	13.9	21	70	-	43	end P3.
110623	P4	-"- ↘	14.00	21	73	-	43	start P4 → 250ft over sea.
110947	P4	250ft		60	86	—	45	end P4
111224	P5	250ft↗	13.2	58	87	↘	45	~~end P4~~ start P5 to FL100. Set to +41C
111619	P5	4000ft	12.4	22	78	—	41	int P5
111739		4000ft		21	78			re start P5. Set to +45C
112421	P5	FL100	11.9	1	83	-	45	end P5 @ FL100
112730			12.4	0	82			set to +5C
113130	descent	2500ft	12.3	20	56	↘	25	

Wet Nephelometer Log

Flight No B206 Date 04/06/06 Operator's name: WILSON Page 3 of 5

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
113500	R2.1	250ft	13.2	50	51	↗	18	Start R2.1. 250ft over sea nr Cabo de Roca.
113530		250ft	13.2	64	55	↗	18	set to 45C
114140			13.7	60	87	↘	42	set to +5c.
114439	2.1	250ft	13.7	61	68	↘	25	end R2.1.
114604	P6	250ft↗	13.8	64	66	↘	23	start P6 → FL063
115752	P6/R3.1	FL063	12.4	18	34	↗	18	end P6, start R3.1. Set temp to +45c.
115600	R3.1	063	12.2	15	68	↗	44	
115955	3.1	063	14.0	11	78	—	45	end R3.1
120200	R3.2	063	14.1	15	71	↘	42	start R3.2. Set temp to +15. into Sun run.
120910	R3.2	063	13.8	18	33	→	15	end R3.2.
121152	orbit 2.1	063	14	16.8	33.1	↗	15	start orbit 2.1. 30 AoB clockwise. Set temp to +43
121534	orbit 2.1	063	14.2	15.5	70.5	↗	42	end orbit 2.1
121620	orbit 2.2	063	14.1	17	72	→	43	start orbit 2.2
122141	P7	063↗						start P7 ↗ FL073
122241	P7	073						end P7. Set to +45c.
122522	R4.1	073	11.8	5.4	83	→	45	Start R4.1
122810	R4.1	073	11.9	0.8	82	↘	45	set to +7c.
	R4.1	"	"	1	42	↘	21	end R4.1
123541	R4.2	073	12.1	1.5	33	↘	16	Start R4.2
123705	"	"	12.1	2	29	↗	15	set to 45c

Wet Nephelometer Log

Flight No **B**206 Date 04/06/06 Operator's name: Wilson Page 4 of 5

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
124443	4·2	073	13·4	2·8	76·3	—	44	end R4·2
124713	P8	073	13·2	0	63	↘	44	Start P8. Set water temp to +6C
124828	P8	083	13·8	0	54	↘	29	end P8.
124927	5·1	083						
125627	5·1	083						
125946	5·2	083	13·0	0	22	↗	13	Start R5·2, Set water to +45C.
130648	5·2	083	11·2	0	66	—	39	
130954	orbit 3·1	083	11·2	0	68	—	39	Start orbit 3·1
131423	3·1	083	11·3	0	69	-	39	end orbit 3·1
131537	orbit 3·2	"	11·3	0	70	-	39	Start orbit 3·1
131958	3·2	"	"	"	69	—	39	end 3·1
132000								climbing to FL150 for transit to Bejar. 25 mins (ish)
133207	P9	150 ↘						start P9
133257		140						int P9
133756	P9	140						restart P9 + set water to +43C
134538		070	13·5	12	82	—	43	int P9
134657	P9	070 ↘	14·1	14	83	-	43	restart P9
135045		9400ft	12·9	32	89	-	43	int P9
135149		"						restart P9
135425	P9	3000ft	13·5	39	91	—	43	int P9

Wet Nephelometer Log

Flight No B206 Date 04/06/2006 Operator's name: WILSON Page 5 of 5

GMT	Run	Height	Sample flow	Dry neph RH	Wet neph RH	Temp ramp	T_{water}	Remarks
135844	P9	3000ft	13.0	35	90	↘	43	set to +40c
135942	P9	-"-	13.0	35	86	—	40	re start profile,
140315	P9	50ft	13.9	37	85	-	40	end P9 at 50ft over Beja airfield.
140530				38	84	↘	40	set to +5C
140952	R6.1	2500ft	13.9	41	63	↘	20	set to +43, Start R6.1 5 min runs.
141452	L.1	-"-	13.7	37	88	—	43	end R6.1
1416	R62	2500ft	13.7	37	88	—	43	start R6.2 - Boundary
141750	-"-	-"-	13.7	35	86	↘	43	Set to +6C - Ramping down
142137	6.2	-"-	13.8	40	62	↘	22	end R62
142	orbit 4.1	-"-	13.7	39	55	↘	18	Start orbit 4.1
142739	4.1	-"-	13.7	37	46	↘	12	end orbit 4.1
142850	4.2	-"-	13.6	39	44	↘		start orbit 4.2
142848	4.2	-"-	13.7	39	41	→	9	end orbit 4.2
143135	P10	2500ft ↗	13.7	39	40	↘	9	start P10 → 3500ft
143230	P10	3500ft		34	44	→	9	end P10
143250	R7.1	3560ft	13.3	34	43	→	9	Start R7.1 Set water to +44C
143756	R7.1/P11	3"-	12.9	31	81	↗	43	end R7.1 / start P10
143844	P11	4500ft	14.5	31	83	—	43	end P10
144037	R8.1	4500ft	14.4	29	82	-	43	start R8.1
145740								Data stop on Ground.

SWS and SHIMS FLIGHT LOG SHEET

Flight #	B206	Date	4/6/06	Operator(s)	Ian Rule	log page	1 of 3

Note to operator: Indicate whether entry refers to SWS or SHIMS

Time	Run id	Alt/FL	Mirr Pos	Int Times		Remarks	SWS	USH	LSH
				Vis	NIR				
0715						Set time on rack pc, 'about time' not working?			
0716						Set time on laptop (only half second fast)			
092743						Start video count = 0:00:00			
093340						Take off Beja			
094240	P1	FL100	Zen + 6	200	500	Start profile			
0945			shims	50	200			x	
095503		2000' qnh				End profile			
100313	R1.1		Zen + 6 to start , then various	200	500	Item 3 on brief, view started with Zen + 6 then scanning fore or aft (depending on position of sun) by approx 10 deg for approx 30 each position			
100710						End run			
100939	R1.2		Zen + 6 to start , then various			Item 3 on brief, view started with Zen + 6 then scanning fore or aft (depending on position of sun) by approx 10 deg for approx 30 each position			
101347						End run			
101726	R1.3	2000' qnh	Nad - 6	200	500	Start run			
101930						End run			
102213	O1.1	2000' qnh	Zen + 6	200	500	Start orbit anti clockwise			
102248						End			
102331	O1.2			200	500	Orbit clockwise			
102542						End			
102600	O1.3			200	500	Orbit clockwise			
102810						End			
102931	O1.4			50	200	Orbit clockwise			
103141						End			
103520	R1.4	2000' qnh	Zen + 6 then various	50	200	Down sun run, sws scanning as before			
103917						End run			
104035	P2	2000' qnh	Zen + 6	100	200	Start profile			
1042			shims	50	200	Zero cal for shims			
104909		FL100				End profile			
105546	P3	FL100	Zen + 6	100	200	Start profile			
110538						End profile			
110623	P4	2000'				Start profile			
110946		250'				End profile over sea			
111221	P5	250'	Zen + 6	100	200	Start profile			
112424		FL100				End profile			

SWS and SHIMS FLIGHT LOG SHEET

Flight #	B206	Date	4/6/06	Operator(s)	Ian Rule	log page	2 of 3

Note to operator: Indicate whether entry refers to SWS or SHIMS

Time	Run id	Alt/FL	Mirr Pos	Int Times		Remarks	SWS	USH	LSH
				Vis	NIR				
113501	R2.1	250’	Nad - 6	200	500	Start run over sea			
114439						End run			
114604	P6					Start profile			
						End profile			
115255	R3.1	6300’	Zen + 6 plus various	100	200	Start run, item 6b, down sun			
115955						End run			
120202	R3.2	FL063	Zen + 6 plus various	100	200	Start run item 6b, into sun run			
120910						End run			
121152	O2.1		Zen + 6	100	200	Start orbit clockwise			
121535						End orbit			
121620	O2.2		Zen + 6	15	15	Start orbit clockwise			
122002						End orbit			
122143	P7		Zen + 6	100	200	Start profile			
122242						End profile			
122523	R4.1	7300’	Zen + 6 plus various	100	200	Start run, item 6b, into sun run			
123223						End run			
123315						Stop tape count = 3:04:51			
123435						Start tape count = 0:00:00			
123543	R4.2	7300	Nad – 6	100	200	Start run, item 6b, sws missed beginning of run			
124443						End run			
124715	P8	7300	Zen + 6	100	200	Start profile			
124826						End profile			
124927	R5.1	8300	Zen +6 plus various	100	200	Start run, item 6b, into sun			
125628						End run, sws modules dropped out			
125945	R5.2	8300	Nad - 6	100	200	Start run, item 6b, down sun, sws back on, sws nir dropped out			
130648						End run			
130955	O3.1	8300	Zen + 6	100	200	Start orbit clockwise			
131425						End orbit			
131537	O3.2	8300	Zen + 6	15	15	Start orbit clockwise			
131958						End orbit			
133202	P9	FL150	Zen + 6	100	200	Start profile, sws nir dropped out, ok now			
1338			shims	30	200	ok			
140317		50’ agl				End profile			
120955	R6.1	2500’	Zen + 6 plus various	100	200	Start run, item 6, down sun run			
144042						End run			
141641	R6.2	2500’	Nad - 6			Start run, item 6, into sun			
142141						End run			
1422?	O4.1	2500’	Zen + 6	100	200	Orbit, missed recording start on Zen			

SWS and SHIMS FLIGHT LOG SHEET

Flight #	B206	Date	4/6/06	Operator(s)	Ian Rule	log page	3	of	3

Note to operator: Indicate whether entry refers to SWS or SHIMS

Time	Run id	Alt/FL	Mirr Pos	Int Times		Remarks	SWS	USH	LSH
				Vis	NIR				
142735						End orbit			
142850	O4.2	2500	Zen + 6	15	15	Start orbit			
143115						End orbit			
143138	P10	2500	Zen+6			Start Profile			
143230									
143250	R7.1	3500’	Zen +6 plus various	100	200	Down sun run			
143757						End run			
	P11								
144027	R8.1	3500’	Zen +6 plus various	100	200	Up sun run			
144530						End run			
145056						Land Beja			
145400						Video off count = 2:18:54			
1457						Rack pc time = DRS plus 3 seconds			

Flight Manager's Instrument Status Log

Flight No. **B** 206 Date: 4th June 2006

Instrument	Operated	Instrument	Operated
Navigation		**Cloud Physics**	
INU	**Y**	**Probes**	
XR5M GPS	**Y**	FFSSP	**N**
Cruciform GPS	**Y**	PCASP	**N**
Satcom C	**Y**	2D-P	**N**
Satcom H	**Y**	2D-C	N
Thermometers		Cloudscope	**N**
De-Iced Temp	**Y**	SID 1	**N**
Non De-Iced	**Y**	SID 2	**N**
Heimann	**Y**	HVPS	**N**
Hygrometers		CIP25	**N**
G. Eastern	**Y**	CIP100	**N**
J. Williams	**Y**		
Nevzorov	**Y**		
TWC	**N**	**Racks:**	
FWVS	**N**	INC	**N**
Radiometers		CCN / CPC	**N/Y**
Upper Clear	**Y**	CVI	**Y**
" Red	**Y**	(CVI includes PCASP)	
" Silicon	**Y**		
" SHIMS	**Y**	**Aerosol**	
Lower Clear	Y	PSAP	**Y**
" Red	**Y**	Nephelometer	**Y**
" Silicon	**Y**	Filters	**Y**
		AMS	**N**
Large Radiometers			
IR Camera	**N**		
TAFTS	**N**	**Others:**	
MARSS	**Y**	AVAPS	**N**
DEIMOS	**N**	IR Camera	**N**
ARIES	**Y**	NIR TDLAS	N
SWS	Y	2BT O3	N
Chemistry		VACC	N
Ozone	Y	PEROXIDE	N
SO2	N	Formaldehyde	N
NOX	Y	ADA	N
CO	Y	CPI	N
ORAC	N	Noxy	N
PAN	N	PTRMS	N
PERCA	N	Bag Sampling	N
WAS	N	Tube Sampling	N

Faults / Incidents Log

Flight No. B206
Date: 4th June 2006

Instruments

1. SATCOM-C reports "system clock error in CMOS clock." Turn-around message received in pre-flight check.
2. PCASP fault prevented use this flight. Laser replaced on ground and PCASP returned to service post-flight

Aircraft

Large amount of insect debris on FFC

Satcom Calls

MISSING LOG SHEETS:

The following log sheets are not available for flight B206:

Log	Reason
CVI	No log is ever taken for CVI

VIDEO RECORDINGS:

3 x Forward Facing Cameras
3 x Downward Facing Cameras

Digital8 video recordings from this flight reside with :

Dave Kindred

EU Aircraft Liaison Officer
Observations Based Research
Jupiter Wing J-M-W014
Met Office
FitzRoy Road
Exeter
Ex1 3PB
UK

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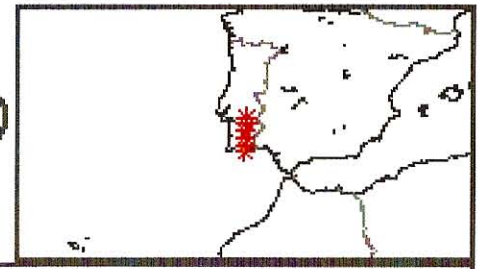
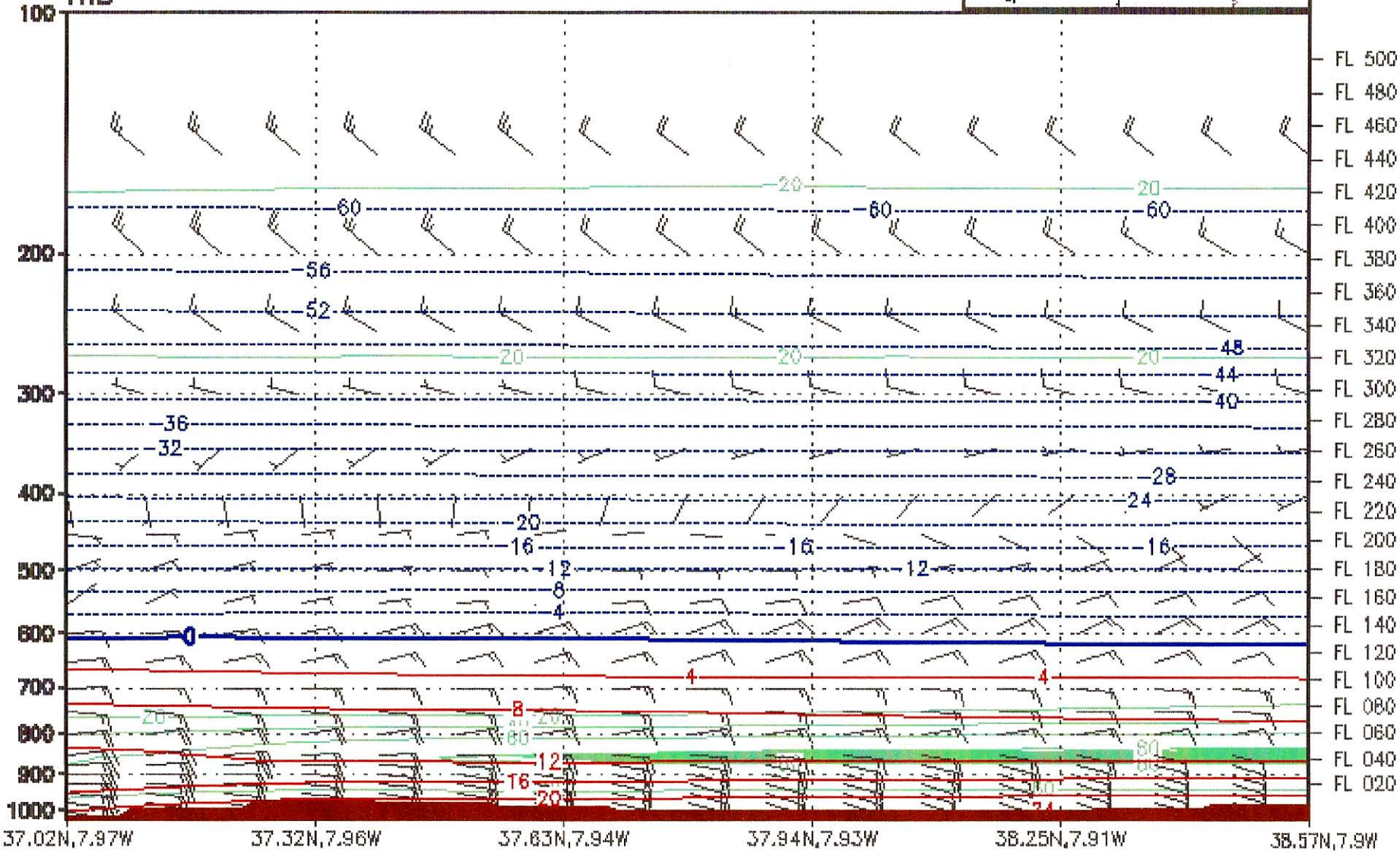
E-mail: dave.kindred@metoffice.gov.uk

AFWA LPFR–NE MM5 15Km

RH(>70%) BARBS(KT)TEMP(C) FL Visibility (statue miles)

VALID:12Z04JUN2006 ICING LGT MDT SVR





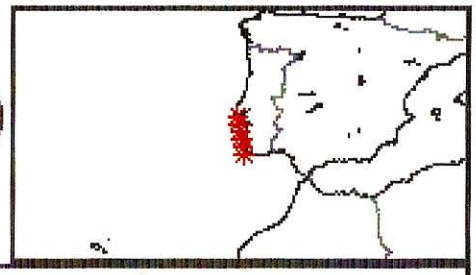
LPFR NE

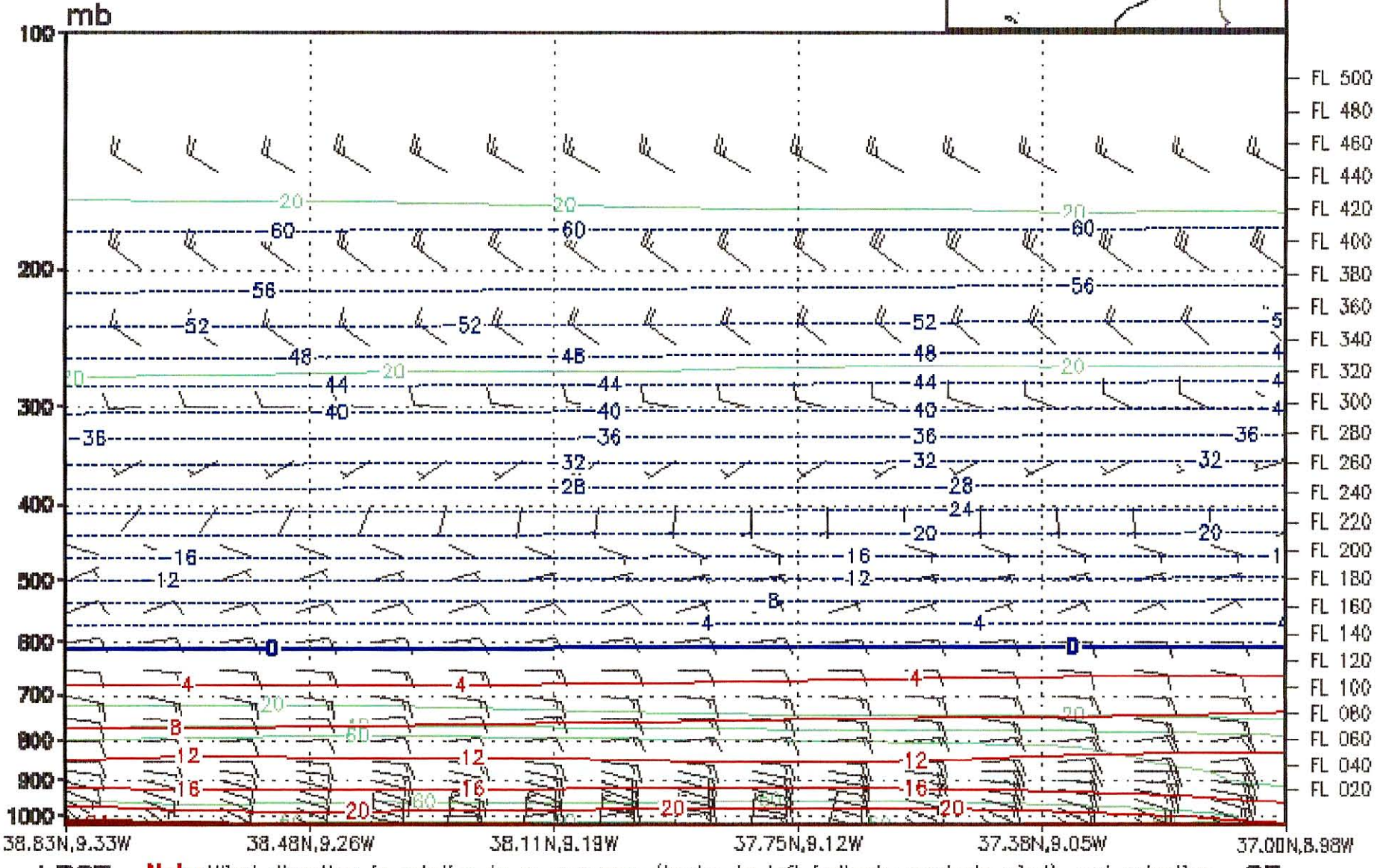
Note: Wind direction is relative to a compass (barbs to left indicate westerly wind), not relavtive to route of flight. Start point is always on left side of cross section, endpoint on right hand side. Model terrain drawn per route of flight.

AFWA LPST–SE MM5 15Km

RH(>70%) BARBS(KT)TEMP(C) FL Visibility (statue miles)

VALID:12Z04JUN2006 ICING LGT MDT SVR



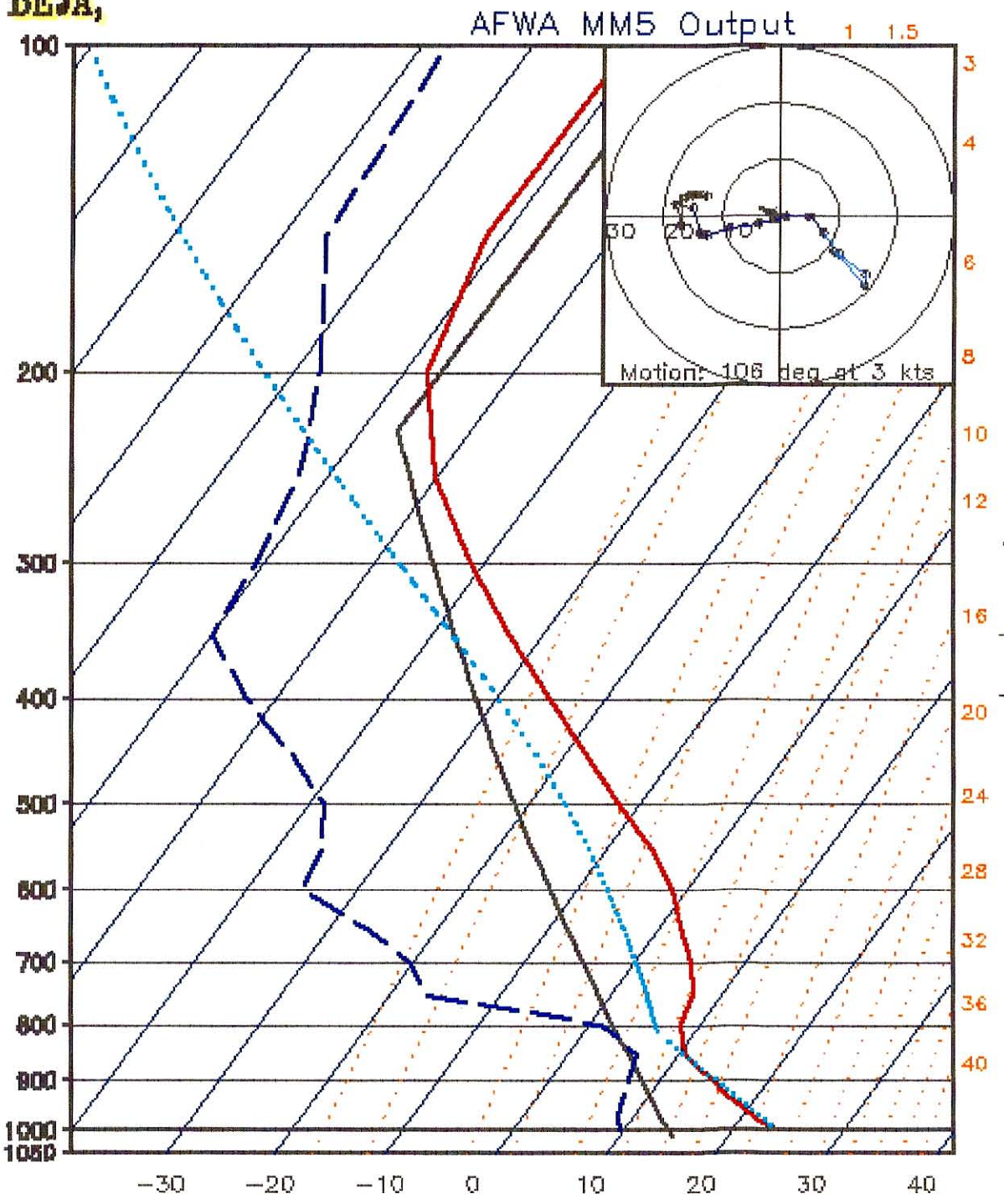


LPST

Note: Wind direction is relative to a compass (barbs to left indicate westerly wind), not relavtive to route of flight. Start point is always on left side of cross section, endpoint on right hand side. Model terrain drawn per route of flight.

SE

BEJA,



Pressure	Height	W Dir	W Speed
(SFC)-> 997	687	105	9
975	1332	105	13
950	2069	105	14
925	2816	105	15
900	3561	105	16
875	4361	100	16
850	5158	100	17
800	6808	85	17
750	8557	85	18
700	10411	85	15
650	12382	80	14
600	14488	75	13
550	16743	75	9
500	19161	70	4
450	21778	50	1
400	24621	275	1
350	27753	270	5
300	31253	290	8
250	35239	305	12
200	39934	305	18
150	45828	310	19
100	54077	305	11

Lid Strength Index = 3.74209
Thickness 1000mb − 500mb = 5655m
Thickness 1000mb − 850mb = 1386m
SWEAT = 114
Environ. Helicity = −11
Storm Rel. Helicity = −8

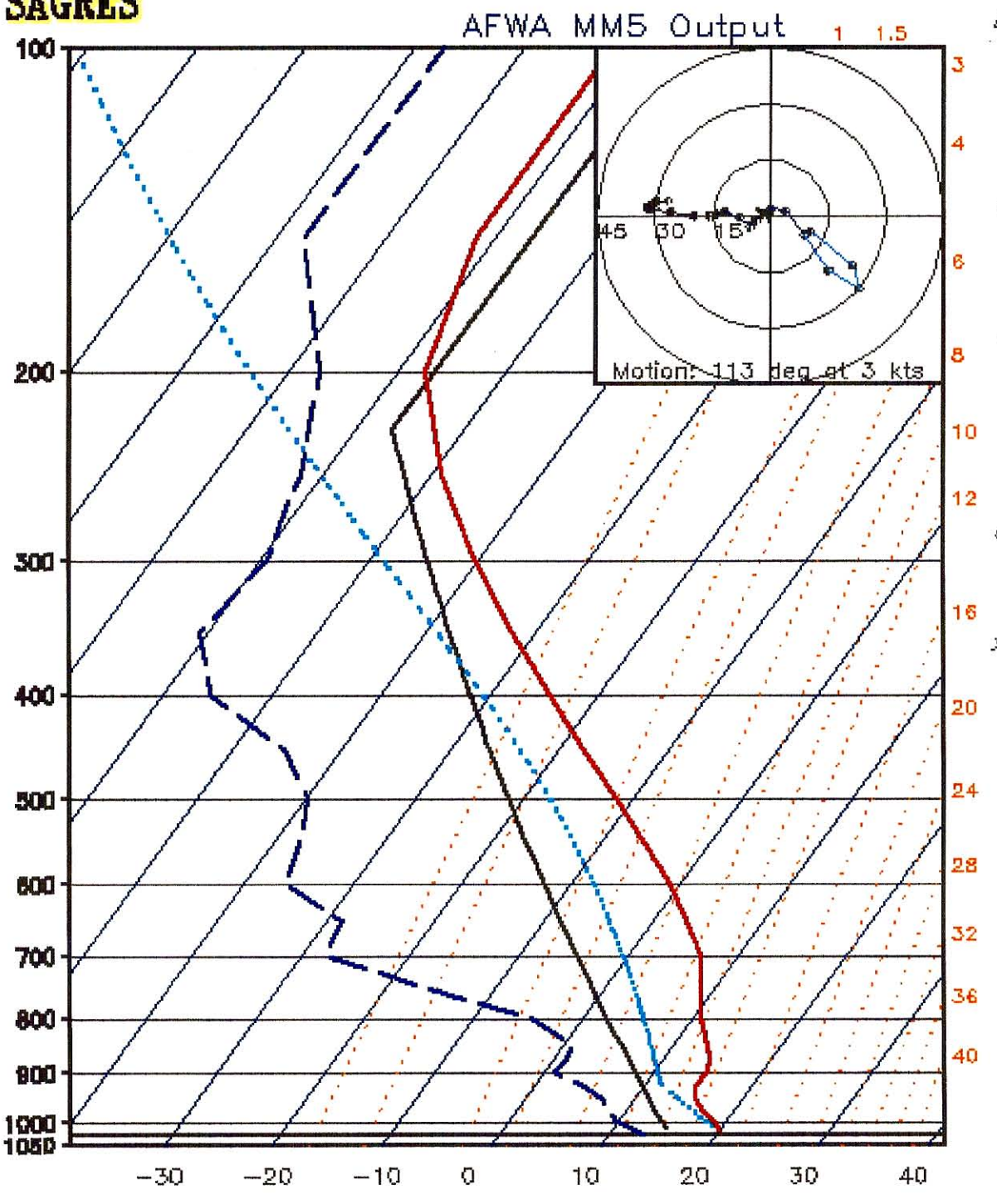
CAPE = 0
K Index = 3
Total Totals = 40
Lifted Index = 5
Convective Inhibition = 0
Max UVV = 0.01 at 100mb
Mean Rel Humid 1000−500mb = 36%
Lapse Rate 850mb − 500mb = 5.29C/Km
Lapse Rate 700mb − 500mb = 6.4C/Km
Lapse Rate 700mb − 400mb = 7.03C/Km
Precipitable Water = 0.75in

CL

036 HR FCST SKEW-T
12Z 04−JUN−2006

GRID PNT LAT = 38.15 LON = −7.68
STATION LAT = 38.016 LON = −7.866

SAGRES



Pressure	Height	W Dir	W Speed
(SRC)-> 1020	0	100	20
1000	579	100	27
975	1292	100	30
950	2016	95	31
925	2758	95	32
900	3519	95	32
875	4300	95	30
850	5104	95	26
800	6767	90	20
750	8525	90	16
700	10388	90	14
650	12368	95	12
600	14477	90	8
550	16734	80	6
500	19156	75	4
450	21774	105	2
400	24628	175	2
350	27767	250	4
300	31272	300	10
250	35276	315	21
200	39990	310	30
150	45685	300	25
100	54116	290	11

Lid Strength Index = 6.3527
Thickness 1000mb – 500mb = 5663m
Thickness 1000mb – 850mb = 1378m
SWEAT = 69
Environ. Helicity = −31
Storm Rel. Helicity = −31

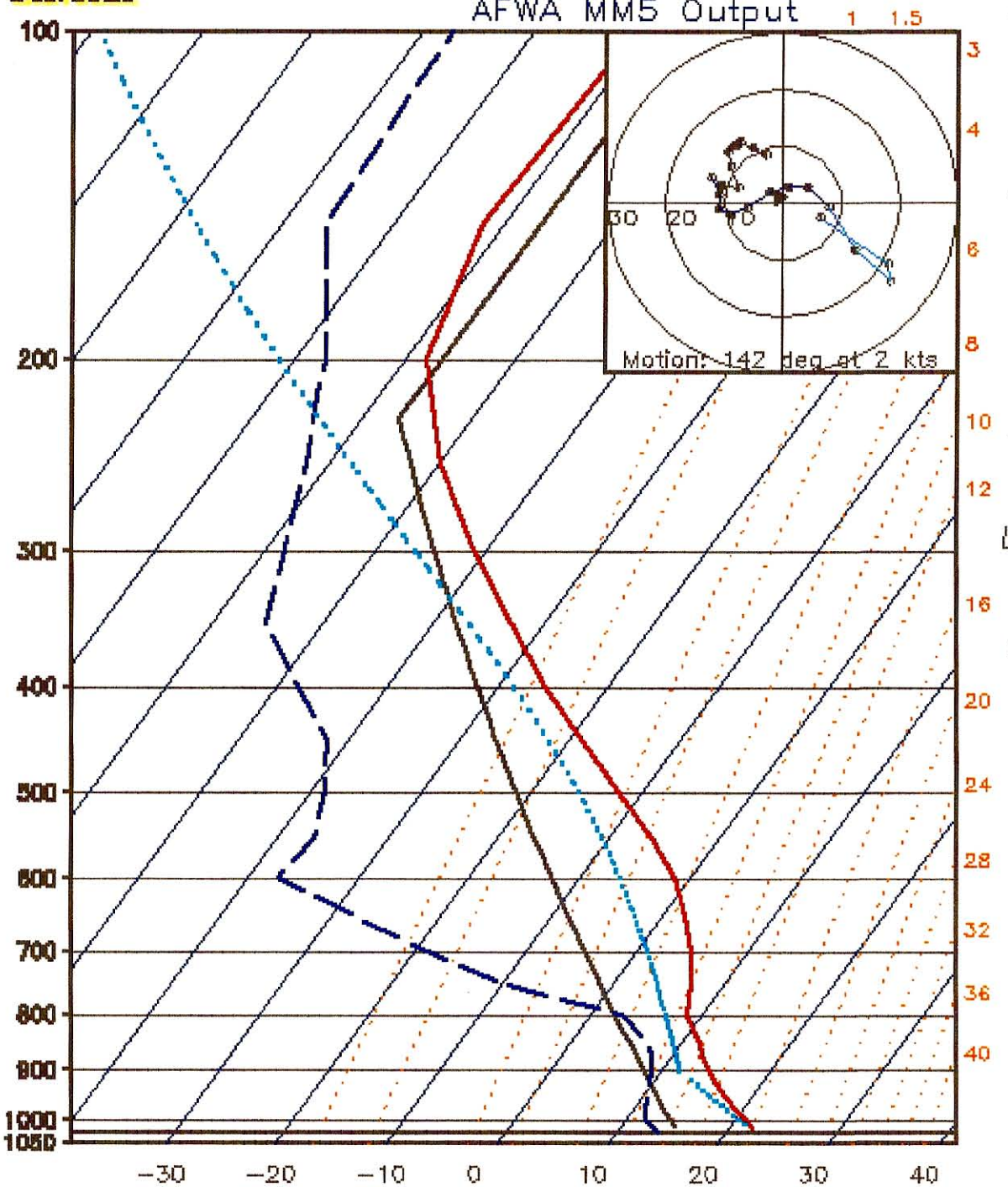
CAPE = 0
K Index = −8
Total Totals = 37
Lifted Index = 6
Convective Inhibition = 0
Max UVV = 0.0196123 at 100mb
Mean Rel Humid 1000–500mb = 30%
Lapse Rate 850mb – 500mb = 5.82C/Km
Lapse Rate 700mb – 500mb = 6.83C/Km
Lapse Rate 700mb – 400mb = 7.23C/Km
Precipitable Water = 0.66in

036 HR FCST SKEW-T
12Z 04-JUN-2006

GRID PNT LAT = 36.815 LON = −8.638
STATION LAT = 37 LON = −8.983

SINTRA

AFWA MM5 Output



Pressure	Height	W Dir	W Speed
(SFC)-> 1020	50	175	5
1000	624	160	9
975	1341	150	11
950	2073	145	13
925	2818	140	13
900	3582	140	13
875	4363	135	13
850	5160	125	11
800	6820	110	8
750	8568	105	11
700	10422	110	13
650	12393	100	11
600	14499	85	11
550	16752	75	9
500	19171	85	6
450	21782	130	3
400	24626	200	3
350	27753	235	5
300	31250	275	8
250	35243	305	15
200	39942	305	23
150	45826	300	21
100	54085	290	7

Lid Strength Index = 3.23243
Thickness 1000mb – 500mb = 5654m
Thickness 1000mb – 850mb = 1383m
SWEAT = 111
Environ. Helicity = −30
Storm Rel. Helicity = −24

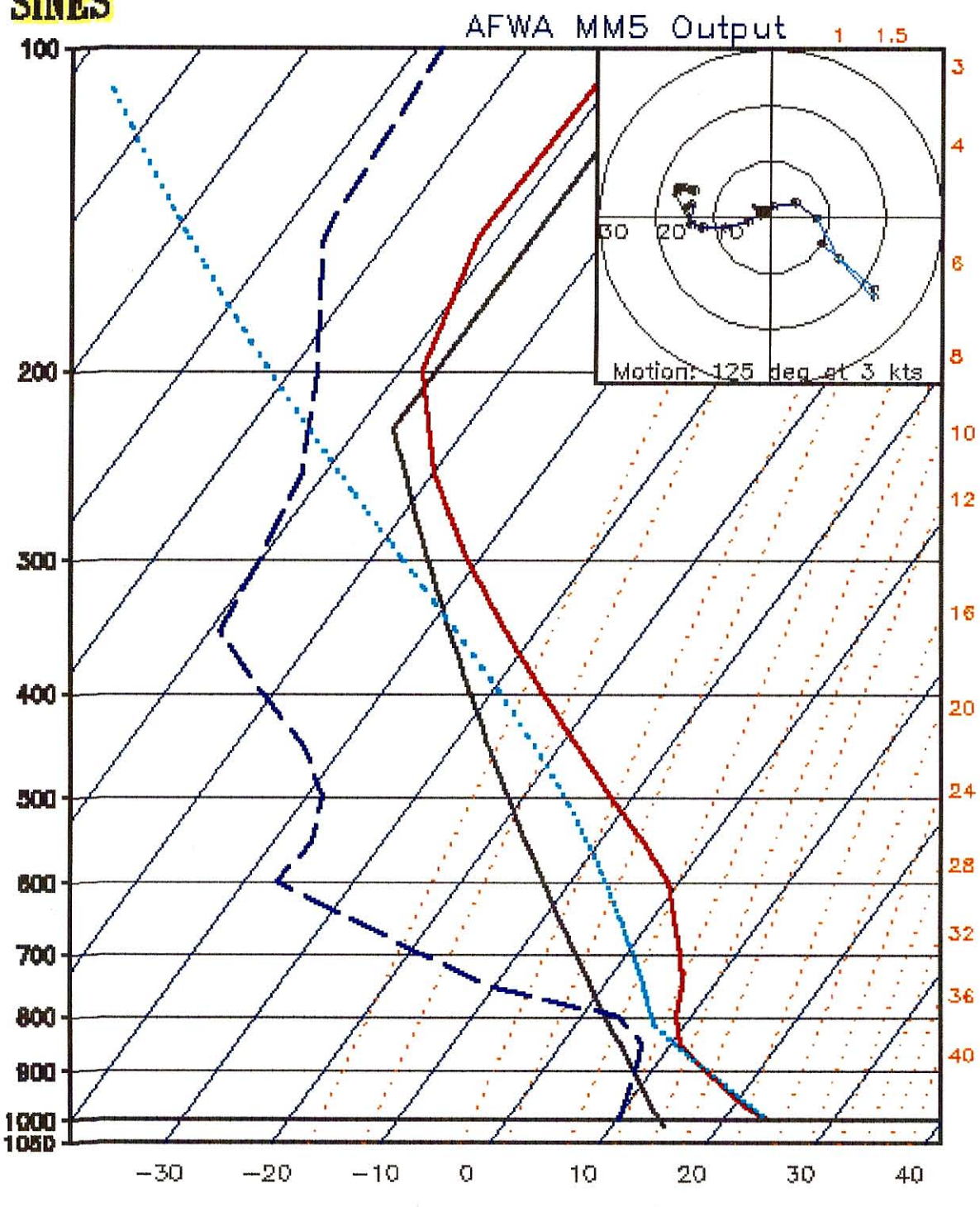
CAPE = 0
K Index = 7
Total Totals = 42
Lifted Index = 4
Convective Inhibition = 0
Max UVV = 0.01 at 100mb
Mean Rel Humid 1000–500mb = 43%
Lapse Rate 850mb – 500mb = 5.64C/Km
Lapse Rate 700mb – 500mb = 6.41C/Km
Lapse Rate 700mb – 400mb = 7.1C/Km
Precipitable Water = 0.93in

LCL

036 HR FCST SKEW-T
12Z 04-JUN-2006

GRID PNT LAT = 39.04 LON = −9.596
STATION LAT = 38.866 LON = −9.4

SINES



Pressure	Height	W Dir	W Speed
(SFC)–> 1010	311	110	9
1000	599	110	12
975	1323	110	14
950	2058	110	15
925	2809	110	16
900	3576	110	17
875	4358	110	17
850	5153	105	17
800	6809	85	14
750	8558	95	15
700	10411	100	14
650	12382	85	14
600	14486	80	12
550	16747	75	8
500	19185	80	4
450	21779	110	2
400	24625	195	2
350	27755	240	5
300	31257	270	8
250	35246	300	14
200	39951	310	23
150	45642	305	22
100	54089	300	10

Lid Strength Index = 3.7809
Thickness 1000mb – 500mb = 5660m
Thickness 1000mb – 850mb = 1386m
SWEAT = 129
Environ. Helicity = −13
Storm Rel. Helicity = −10

CAPE = 0
K Index = 6
Total Totals = 42
Lifted Index = 4
Convective Inhibition = 0
Max UVV = 0.0137981 at 950mb
Mean Rel Humid 1000–500mb = 40%
Lapse Rate 850mb – 500mb = 5.39C/Km
Lapse Rate 700mb – 500mb = 6.34C/Km
Lapse Rate 700mb – 400mb = 6.99C/Km
Precipitable Water = 0.86in

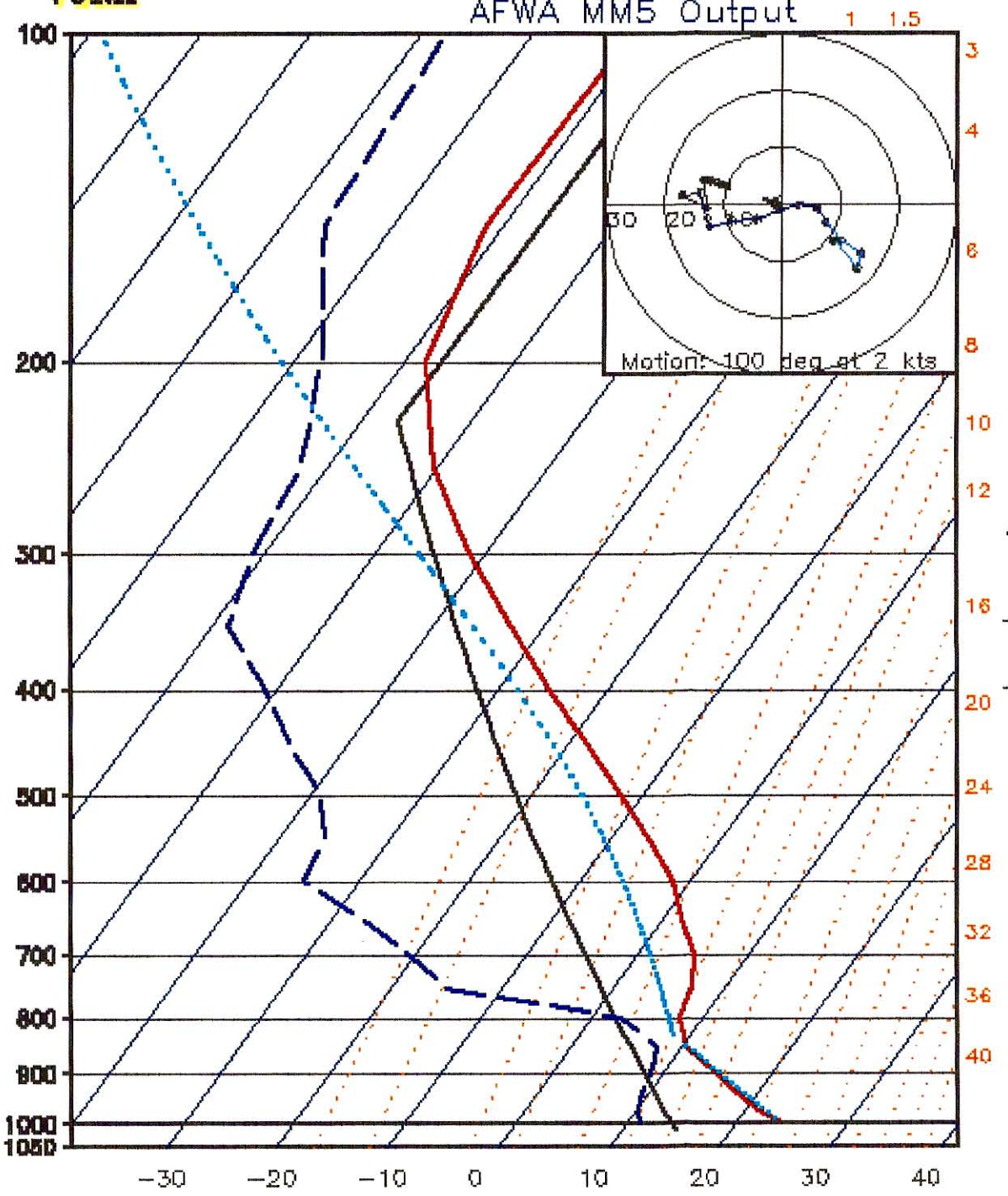
CL

036 HR FCST SKEW-T
12Z 04-JUN-2006

GRID PNT LAT = 38.15 LON = −8.638
STATION LAT = 37.966 LON = −8.849

VORA

AFWA MM5 Output



Pressure	Height	W Dir	W Speed
(SFC)-> 994	765	110	7
975	1342	110	10
950	2078	110	11
925	2828	110	12
900	3592	110	13
875	4373	110	13
850	5170	105	14
800	6820	85	13
750	8565	95	17
700	10416	100	14
650	12390	80	13
600	14493	70	13
550	16744	70	9
500	19163	60	5
450	21776	20	1
400	24622	275	3
350	27751	275	6
300	31249	295	8
250	35231	305	12
200	39922	305	16
150	45816	310	17
100	54066	305	11

Lid Strength Index = 2.86411
Thickness 1000mb − 500mb = 5653m
Thickness 1000mb − 850mb = 1387m
SWEAT = 127
Environ. Helicity = −6
Storm Rel. Helicity = −4

CAPE = 0
K Index = 4
Total Totals = 42
Lifted Index = 4
Convective Inhibition = 0
Max UVV = 0.00711067 at 400mb
Mean Rel Humid 1000−500mb = 40%
Lapse Rate 850mb − 500mb = 5.3C/Km
Lapse Rate 700mb − 500mb = 6.43C/Km
Lapse Rate 700mb − 400mb = 7.06C/Km
Precipitable Water = 0.81in

LCL

036 HR FCST SKEW-T
12Z 04-JUN-2006

GRID PNT LAT = 38.595 LON = −7.68
STATION LAT = 38.566 LON = −7.9